

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
23 June 2005 (23.06.2005)

PCT

(10) International Publication Number
WO 2005/057228 A1

(51) International Patent Classification⁷: **G01R 31/06**,
31/305, G03G 15/00

(21) International Application Number:
PCT/US2003/036093

(22) International Filing Date:
12 November 2003 (12.11.2003)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant (for all designated States except US): **INTERNATIONAL BUSINESS MACHINES CORPORATION** [US/US]; New Orchard Road, Armonk, NJ 10504 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **CLINE, Christopher, W.** [US/US]; 41 Flower Rd., Hopewell Junction, NY 12533 (US). **YARMCHUK, Edward, J.** [US/US]; 42 Sycamore Road, Mahopac, NY 10541 (US). **ARENA,**

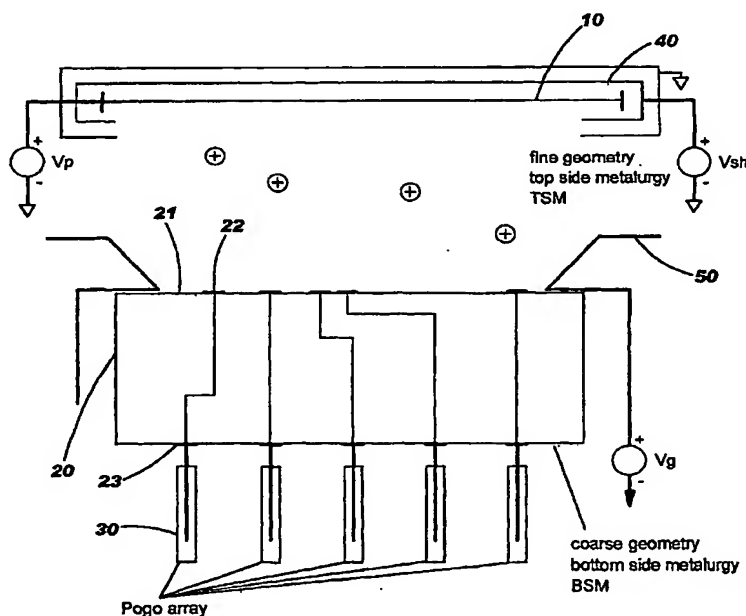
Vincent, A. [US/US]; 14 Shawnee Road, Putnam Valley, NY 10579 (US). **MERTE, Donald, A.** [US/US]; 22 Mapleview Road, Poughkeepsie, NY 12603 (US). **PICUNKO, Thomas** [US/US]; 18 Barry Road, Scarsdale, NY 10583 (US). **WOJSZYNSKI, Brian, J.** [US/US]; 7 Douglas Road, Hyde Park, NY 12538 (US). **HENDRICKS, Charles, J.** [US/US]; 171 Dorothy Lane, Wappingers Falls, NY 12590 (US). **SCAMA, Michael, E.** [US/US]; 13 Oakcrest Drive, Goshen, NY 10924 (US). **OLYHA, Jr., Robert, S.** [US/US]; Eight Meier Road, LaGrange, NY 12603-6515 (US). **HALPERIN, Arnold** [US/US]; 14 Furnance Brook Road, Peekskill, NY 10567 (US).

(74) Agent: **CIOFFI, James, J.**; INTERNATIONAL BUSINESS MACHINES CORPORATION, Dept. 18G, Bldg. 300/482, 2070 Route 52, Hopewell Junction, NY 12533 (US).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,

[Continued on next page]

(54) Title: IONIZATION TEST FOR ELECTRICAL VERIFICATION



(57) Abstract: A method and apparatus for the non-contact electrical test of both opens and shorts in electronic substrates (20). Top surface electrical test features (22) are exposed to an ionization source (10) under ambient conditions and the subsequent charge build up is measured as a drain current by probes contacting corresponding bottom surface features (23). Opens are detected by an absence of a drain current and shorts are detected by turning off the ionization source (10) and re-measuring the bottom surface probes with a varying bias applied to each probe in the array.

WO 2005/057228 A1



MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

— of inventorship (Rule 4.17(iv)) for US only

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.